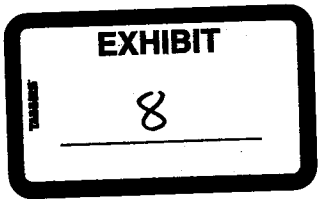
IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel. W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA and OKLAHOMA SECRETARY OF THE ENVIRONMENT C. MILES TOLBERT, in his capacity as the TRUSTEE FOR NATURAL RESOURCES FOR THE STATE OF OKLAHOMA Plaintiff, vs. TYSON FOODS, TYSON POULTRY, INC., TYSON CHICKEN, INC., COBB-VANTRESS, INC., AVIAGEN, INC., CAL-MAINE FOODS, INC., CAL-MAINE FARMS, INC., CARGILL, INC., CARGILL TURKEY PRODUCTS, LLC, GEORGES'S, INC., GEORGE'S FARMS, INC., PETERSON FARMS, INC., SIMMONS FOODS, INC., AND WILLOWBROOD FOODS, INC. Defendants.	)	Case No. 4:05-cv-00329-GKF-SAJ

Declaration of Christopher M. Teaf

The undersigned, Christopher M. Teaf, does hereby declare:

1. My name is Dr. Christopher M. Teaf. I have a Bachelor's degree in Biology (with Honors) from Pennsylvania State University, a Master's degree in Biological Science from Florida State University, and a Ph.D. in Toxicology from the University of Arkansas for Medical Sciences. I conducted my research at the Division of Genetic Toxicology, National Center for Toxicological Research.



2. I am the Associate Director at the Center for Biomedical & Toxicological Research and Waste Management at Florida State University (since 1983), as well as Director of Toxicology for the research firm Hazardous Substance & Waste Management Research, Inc. since 1985 (President since 1989). I have held adjunct teaching appointments at Florida State University/State University System Program in Medical Sciences and Florida A&M University College of Pharmacy and Pharmaceutical Sciences.

3. My research and scientific advisory activities are in the area of risk assessment for human exposure to chemical and biological hazards in occupational and/or environmental circumstances. My principal activities for approximately 25 years have included performance of risk assessments concerning human health and evaluation of adverse effects of chemical and biological exposures under requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, Superfund), Superfund Amendments and Reauthorization Act (SARA), Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Occupational Safety and Health Act (OSHA), and other related federal or state legislation. This has involved evaluation of potential human health impacts of many organic substances (e.g., petroleum products, pesticides, chlorinated and non-chlorinated substances), inorganic agents (e.g., acids/caustics, metals, particulates, fibers) and microbiota (e.g., bacteria, molds, fungi) in air, water, soils and sediments.

4. I have served as a peer reviewer for publications submitted to numerous scientific journals and presently serve on Editorial Boards for several of these scientific journals. I am Senior Human Health Editor for *Human & Ecological Risk Assessment,* an international journal. I have published many scientific papers, articles and book chapters concerning toxicological effects and risk evaluations related to occupational and environmental exposures.

5. For over 25 years, I have directed and conducted research projects and human health education activities for many agencies such as the World Health

Organization (WHO), North Atlantic Treaty Organization (NATO), U.S. Environmental Protection Agency (U.S. EPA), U.S. Department of Energy (U.S. DOE), U.S. Department of Agriculture (U.S. DOA), Agency for Toxic Substances and Disease Registry (ATSDR), Florida Department of Environmental Protection (FDEP), Florida Department of Health (FDOH), and many local governmental entities. These activities have been conducted in the United States, Eastern Europe (e.g., Bulgaria, Czech Republic, Hungary, Poland), Central Asia (e.g., Kazakhstan), and Russia.

6. I have provided advisory services on toxicology, risk assessment, and environmental health issues to the U.S. Department of Justice, Florida State Attorney's Office, and Attorneys General for Florida, Washington, and Oklahoma. Since 1986, I have been qualified to provide expert testimony to federal and state courts, administrative proceedings, and to regulatory or legislative groups concerning toxicology, environmental chemistry, occupational exposure, health effects of chemicals, and risk assessment.

7. I have been retained in this case by the Oklahoma Office of the Attorney General to provide technical analysis and opinions in the areas of toxicology and human health for chemical and biological issues associated with the large-scale land application of poultry waste within the Illinois River Watershed (IRW).

8. I was asked to review the document entitled "Defendant's Joint Motion for Additional Time to Produce Expert Reports and Integrated Brief in Support" (filed June 2008), and I have comments as defined in the following paragraphs.

9. The State of Oklahoma, et al. v. Tyson Foods, Inc., et al. lawsuit was filed approximately three years ago. A great deal of the information that I used to develop my opinions for this case was gathered from that time until the present. I believe that three years is ample time to develop a working hypothesis (or hypotheses) regarding the connection between land application of poultry waste and degradation of water quality within the IRW. A large period of time has gone by for the defendants to gather and analyze publicly available data, as well

as to gather and analyze data of their own to test and refute or confirm their hypothesis or hypotheses. Beyond the publicly available data [e.g., from Oklahoma Department of Environmental Quality (ODEQ), Oklahoma Water Resources Board (OWRB), U.S. Army Corps of Engineers (ACoE), the Oklahoma Conservation Commission (OCC), and Oklahoma Scenic Rivers Commission], data gathered by the plaintiffs has been produced as obtained since at least February 2007, giving defendants the ongoing ability to analyze and draw their own conclusions.

10. Human health issues regarding the presence of bacteria, disinfection byproducts (trihalomethanes/THMs and haloacetic acids/HAA5s) and cyanobacteria (harmful blue-green algae) are not novel concepts, nor are they unique to this case. An extensive array of sampling results and analytical information is accessible to the general public. This information is readily available on the electronic websites of ODEQ and OWRB and by contacting appropriate representatives of programs within these and other agencies. In addition, the OCC, United States Geological Survey (USGS), and the ACoE have collected data from many locations within the IRW, and that information is also publicly available, including to the defendants.

11. Knowledge concerning the presence of disinfection byproducts and their association with human health effects dates back to the 1979 federal regulations for trihalomethanes. Cantor and colleagues published a report in 1978 describing conclusions related to observed associations between cancer mortality and halogenated disinfection byproducts in treated drinking water. In accord with requirements of the Safe Drinking Water Act amendments of 1996, the Stage 1 Disinfectants and Disinfection Byproduct Rule was announced in 1998, followed eight years later, in 2006, by the most recent rule, the Stage 2 Disinfectants and Disinfection Byproduct Rule. These rules have set increasingly and sequentially more stringent limits on allowable amounts of THMs and related substances in drinking water. These are not new concepts, nor new regulations.

12. In 2005, EPA announced the second Drinking Water Contaminant List (CCL), which included cyanobacteria (blue green algae). Knowledge of health effects in humans and livestock associated with cyanobacteria date back at least several decades, and World Health Organization documents identify serious health concerns (e.g., gastroenteritis from cyanobacteria) dating back to the 1930's in the U.S. The CDC has for a number of years maintained their own agency website concerning Harmful Algal Blooms (HABs) and that site describes cyanobacteria and information associated with the algae. Fruh described the overall picture of eutrophication in 1967 explaining that highly eutrophic lakes result in large quantities of algae, including the blue green forms, and degradation of water quality. Other evidence in this case has shown that Lake Tenkiller, the major impoundment of the Illinois River, has reached a highly eutrophic state due to nutrients (e.g., phosphorus) which are in large part related to land application of poultry waste in the IRW.

13. Land spreading of poultry waste has long been recognized as a major bacterial contamination source. Knowledge of fecal indicator organisms associated with the land application of poultry litter dates back at least to Crane et al. (1980). In addition to fecal indicator organisms, the association between the over application of poultry litter and high phosphorus levels in the soils has been known for several years by at least one of defense experts, Frank Coale (2002 Maryland Research article). The potential problem also is recognized in materials acquired during document production from defendants in this case (e.g., Boales et al., undated as TSN117291SOK; USEPA, 2003 as TSN120367SOK; ASWCC, undated as TSN117349SOK). Thus, the issue has been square in the public eye for 5 years or more, even independent of this lawsuit.

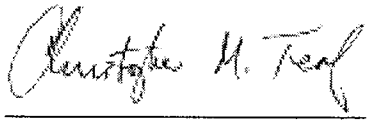
14. There are several public reports that have been issued by the State of Oklahoma analyzing a variety of water quality aspects within the IRW. Some of these reports include the annual Beneficial Use Monitoring Program (BUMP) Reports, the biennial Integrated Water Quality Reports, and the OCC Illinois River Basin Study, to name just a few. Those reports from multiple public

agencies have raised specific water quality concerns and that information has been widely publicized and available.

15. It is my opinion that the data needed to investigate the claims made in this lawsuit have been readily available over the last three years. This includes the ability to collect and analyze environmental data based upon a scientific hypothesis that could have been developed by defendants' experts. If defendants' experts believed that it would be useful to collect and analyze environmental data as support for a reasoned hypothesis, they could have initiated that process from the beginning of this case.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on 30 June 2008



CHRISTOPHER M. TEAF, Ph.D.